

Name: \_\_\_\_\_

Score:

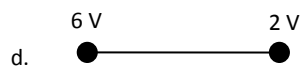
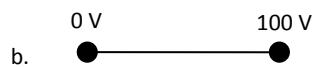
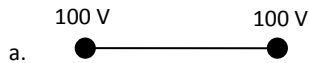
Regents Physics

Worksheet 4.2.1 – Electrical Current (20 points)

Show all work – multiple choice answers MUST be proven for full credit!

1. A current of 5.0 amperes is passing through a piece of wire. Determine how long it takes for 30 coulombs of charge to pass through this wire.

2. Draw an arrow in each diagram to show the direction in which current will flow. If there is no current write the phrase "I = 0" and the reason for which there is no current in the diagram.



3.  $4.0 \times 10^{18}$  electrons pass through a wire every 2.0 seconds.

- a. What is the charge on this number of electrons in coulombs?

- b. Determine the rate of current flow through the wire.

4. A spark generates a current of 4.2 milliamps and lasts for 2.0 milliseconds.

- a. Determine the total amount of charge that is transferred in this spark.

- b. How many electrons were transferred in the spark?

5. Which 20 coulombs of charge pass a given point in a conductor every 4.0 seconds, the current through this point is

- (1) 80 A
- (2) 0.20 A
- (3) 16 A
- (4) 5.0 A

*Proof: Show calculations.*

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6. The current passing through a light bulb is 4.0 amperes. How many coulombs of charge pass through the light bulb in one minute?

- (1) 120 C
- (2) 4.00 C
- (3) 240 C
- (4) 480 C

*Proof: Show calculations.*

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7. An ampere can be defined as one

- (1) coulomb per second
- (2) joule per coulomb
- (3) newton per coulomb
- (4) ohm per volt

*Proof: Demonstrate using the equation for current.*

8. How many electrons will accumulate on a television screen in 5.0 seconds if the current supplied to the screen is  $5.0 \times 10^{-5}$  ampere?

- (1)  $3.1 \times 10^{24}$
- (2)  $6.3 \times 10^{18}$
- (3)  $1.6 \times 10^{15}$
- (4)  $1.0 \times 10^5$

*Proof: Show calculations.*